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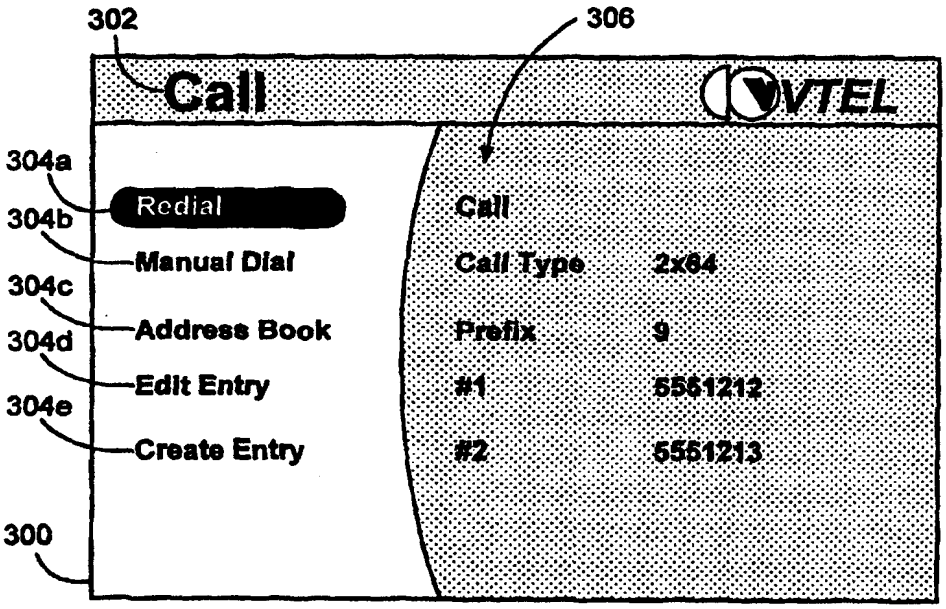
(54) Title: MENU SYSTEM FOR VIDEO TELECONFERENCING ENVIRONMENT

(57) Abstract

A menu system for a video teleconferencing system is provided. The menu system is arranged as a hierarchical series of levels (302, 306). At the highest level (302), the menu system includes one or more first level menus (304a–304e). Each first level menu is activated by a respective button on a remote control (216) or other control device. Each first level menu (300) includes a series of options. Each option (304a–304e) has an associated second level menu (306) that is displayed when the option is highlighted (304a). A second level menu (306) may be activated by highlighting its associated first level option (304a) and then pressing a predetermined button on the remote control (112). Once the level menu is activated, the user may select from a series of second level options (400) included in the second level menu. Each second level option (400a–400e) activates an associated selection dialog. The menu system is configured so that all active levels of the hierarchy are displayed at all times. Thus, an active selection dialog would be shown along with its associated active second level menu and its associated first level menu. This orients the user and simplifies navigation. All active options are also maintained in a highlighted state. This reinforces the users ability to determine his or her current location within the menu hierarchy.



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Menu System For Video Teleconferencing Environment

FIELD OF THE INVENTION

The present invention relates generally to menu systems and user interfaces. More specifically, the present invention includes an enhanced menu system for simplifying the use of video conferencing and related systems.

BACKGROUND OF THE INVENTION

The use of menus, as a part of user interfaces, is becoming increasingly common. This is exemplified most clearly within the user interfaces of modern computer systems. These computer systems often provide powerful menus that greatly simplify the use of these devices. For this reason, menus have become almost ubiquitous within this particular environment.

The power of traditional menu systems is partially dependent on their complexity. Menus may be deeply nested in complex hierarchies. Different features may be activated by different mouse buttons, different numbers of button clicks or combinations of keyboard inputs and mouse inputs. This works well in the computer environment because the average computer user may be counted on to spend a great deal of time interacting with his or her computer. This means that the average user will have time to learn many features of a complex menu system. It also means that the average user will probably not forget these learned features between uses of his or her computer system.

Unfortunately, the same pattern of use does not necessarily hold for users of other devices. For example, a typical user of a video teleconferencing system may access the system far less frequently than the average computer user. For this reason, these users may not have time to learn all of the complexities of a computer-like menu system. Less frequent use also makes users more prone to forget individual features between uses. This can make systems like video teleconferencing systems, seem arcane or frustrating.

For these reasons, a need exists for an easy-to-use menu system for video teleconferencing systems and related systems. To be effective, these menu systems must combine ease of use with the ability to handle complex user interaction. These systems must also be designed to accommodate the fact that the average user may not remember their powerful features between successive system uses.

SUMMARY OF THE INVENTION

The present invention provides a menu system for video teleconferencing and related systems. The menu system is arranged as a hierarchical series of levels. The highest level of this hierarchy is a group of buttons included within a remote control or other device for user

interaction. Each of these top level buttons activates a respective first level menu on a video display.

Each first level menu includes an associated label or icon on the display screen that reminds the user which menu he or she has selected. Thus, if the user hits a setup button, the corresponding first level menu includes a label such as "setup" or an icon associated with the setup process.

Each first level menu also includes a list of one or more first level options. Preferably, these are arranged as a vertical column. The menu system allows the user to choose between the first level options within this list. In the case where a remote control is used, the selection process is typically performed using up and down buttons included on the remote control. The up and down buttons cause each first level option to be highlighted in turn. When the user reaches the desired first level option, he or she presses a select button on the remote control to select that first level option.

Each first level option may have an associated second level menu. The second level menu for the highlighted first level option is displayed next to the vertical column of first level options. It should be noted that the displayed second level menu does not replace the first level menu. This means that the activated first level menu (along with its identifying label or icon) remains visible while the second level menu is displayed. This provides the user with a clear indication of where he or she is in the menu hierarchy. It should also be noted that the selected first level option remains highlighted whenever the associated second level menu is displayed. This reinforces the user's ability to orient himself within the menu hierarchy.

Second level menus may be interactive or non-interactive. Non-interactive second level menus are used to display data. As an example, a non-interactive second level menu may be associated with a "status" first level option. When the user causes the "status" first level option to be highlighted, the associated non-interactive second level menu would be used to display status information.

Interactive second level menus are used as sub-menus and must be activated before use. The user activates a second level menu of this type by first highlighting its associated first level option. Once the desired second level menu is highlighted, the user presses an activating button. Like first level menus, interactive second level menus preferably include respective lists of options. In this case, these options are referred to as second level options. Preferably, these options are arranged as a vertical column. The menu system allows the user

to choose between the second level options in a manner that is similar to the selection of first level options.

Each selected second level option may add a selection dialog to the video display. It should be noted that the selection dialog is added to the second level menu and does not replace the second level menu or first level menu. This means that the activated first and second level menus remain visible during the activation of the selection dialog. Once again, this provides the user with a clear indication of where he or she is in the menu hierarchy. The selected second level option remains highlighted during the time that the second level menu and dialog is activated. This reinforces the user's ability to orient himself within the menu hierarchy.

The selection dialogs allow the user to perform various tasks, such as entering a name, or choosing a particular value from a list. For typical embodiments, the user performs these tasks using the up, down, enter and other remote control buttons.

As described, the menu system includes a multilevel hierarchy with selection buttons at the top, followed by first and second level menu levels, followed by selection dialogs. An identifying label (or icon) such as "setup" or "call," is associated with the menu selection buttons and appears on the display screen. During operation, the menu system ensures that each higher level menu is maintained onscreen during activation of lower level menus. The menu system also ensures that the selected first and second level options in each menu remain highlighted. This makes the menu system particularly easy to navigate.

In general, it should be appreciated that the menu system may be configured to include more or fewer menu levels. In each case, it is desirable to maintain the display of higher level menus during the activation of lower level menus as well as the highlighting of selected options within each level.

For some embodiments, it may be desirable to augment the menu system through the use of an escape or exit button included in the remote control. When the user presses the escape button the menu system exits from any currently active selection dialog and any currently active menu. This provides the user a one-step shortcut for exiting the menu hierarchy.

Advantages of the invention will be set forth, in part, in the description that follows and, in part, will be understood by those skilled in the art from the description herein. The advantages of the invention will be realized and attained by means of the elements and combinations particularly pointed out in the appended claims and equivalents.

BRIEF DESCRIPTION OF THE DRAWINGS

The accompanying drawings, that are incorporated in and constitute a part of this specification, illustrate several embodiments of the invention and, together with the description, serve to explain the principles of the invention.

Figure 1 is a diagram of a video teleconferencing system shown as a representative environment for the present invention.

Figure 2 is a diagram of remote control device as used by an embodiment of the present invention.

Figure 3 is a diagram of a menu display as produced by an embodiment of the present invention.

Figure 4 is a diagram of a menu display as produced by an embodiment of the present invention showing activation of a second level menu.

Figure 5 is a diagram of a menu display as produced by an embodiment of the present invention showing activation of a command confirmation selection dialog.

Figure 6 is a diagram of a menu display as produced by an embodiment of the present invention showing activation of a drop-down list selection dialog.

Figure 7 is a diagram of a menu display as produced by an embodiment of the present invention showing activation of a character table selection dialog.

Figure 8 is a diagram of a menu display as produced by an embodiment of the present invention showing activation of a numeric entry selection dialog.

Figure 9 is a diagram of a menu display as produced by an embodiment of the present invention showing activation of a slide bar selection dialog.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Reference will now be made in detail to preferred embodiments of the invention, examples of which are illustrated in the accompanying drawings. Wherever convenient, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

ENVIRONMENT

In Figure 1, a video teleconferencing system 100 is shown as a representative environment for the present invention. Structurally, video teleconferencing system 100 includes one or more display monitors 102, one or more cameras 104, one or more microphones 106 and one or more loudspeakers 108. The actions of display monitor 102, camera 104, microphone 106 and loudspeaker 108 are coordinated by a control unit 110. A user (not shown) interacts with control unit 110 using a remote control 112 or other input

device. Control unit 110 also includes electronic circuits to encode and decode audio and video data and to sent and receive it over data links (not shown).

As shown in Figure 2, remote control 112 includes a series of buttons. For the purposes of this description, it should be noted that these buttons include four directional buttons: an up button 200, a down button 202, a right button 204 and a left button 206. Remote control 112 also includes a select button 208, a save button 210, an exit button 212, a setup button 214, a call button 216 and a delete button 218.

MENU SYSTEM

The present invention provides a menu system for video teleconferencing and related systems. The menu system is arranged as a hierarchical series of levels. For the particular embodiment being described, the highest level of this hierarchy corresponds to setup button 214 and call button 216. User activation of either of these buttons causes control unit 110 to display a respective first level menu on display monitor 102. It should be appreciated that different embodiments of the present invention may include more or fewer button-activated first level menus.

Figure 3 shows a representative first level menu 300. First level menu 300 is intended to correspond to call button 216. This means that control unit 110 displays first level menu 300 each time call button 216 is activated. First level menu 300 includes a label or icon 302 that reminds the user which first level menu 300 he or she has selected. In the case of first level menu 300 of Figure 3, label 300 reads "Call". This corresponds to call button 216.

First level menu 300 includes a series of first level options 304a through 304e. First level options 304 are arranged as a vertical column. In general, it may be appreciated that first level options 304 may be arranged in any suitable pattern and that the column configuration of Figure 3 is purely representative. Whenever first level menu 300 is active, one of first level options 304 is highlighted. The user may control the particular first level option 304 that is highlighted using up button 200 and down button 202.

A second level menu 306 is positioned to be adjacent to the column of first level options 304. Each first level option 304 has an associated second level menu 306 of this type. Control unit 110 displays the second level menu 306 for the selected first level option 304 whenever that first level option 304 is highlighted. Thus, if the user changes the first level option 304 that is highlighted (using up button 200 and down button 202), control unit 110 updates the particular second level menu 306 that is displayed. For the particular example of

Figure 3, the display of second level menu 306 and the column of first level options 304 is side-by-side. Other embodiments may use other forms of concurrent display.

Second level menus 306 may be interactive or non-interactive. Non-interactive second level menus 306 are used to display data. As an example, a non-interactive second level menu 306 may be associated with a "status" first level option 304. When the user causes the "status" first level option 304 to be highlighted (using up button 200 and down button 202) the associated non-interactive second level menu 306 would be used to display status information.

Interactive second level menus 306 are used as sub-menus and must be activated before use. The user activates a second level menu 306 of this type by first highlighting its associated first level option 304 (using up button 200 and down button 202). Once the desired first level option 304 is highlighted, the user presses right button 204. This is shown in Figure 4, where a second level menu 306 associated with first level option 304a has been activated.

Interactive second level menus 306 are similar, in some ways, to first level menus 300. Thus, as shown in Figure 4, second level menu 306 includes a series of second level options 400a through 400e. Whenever second level menu 306 is active, one of second level options 400 is highlighted. The user may control the particular second level option 400 that is highlighted using up button 200 and down button 202. It should be noted that activation of a second level menu 306 does not cause the associated first level option 304 to become un-highlighted. Instead, the associated first level option 304 remains highlighted and one of the second level options 400 becomes highlighted as well. This provides the user with a visual clue as to which first level option 304 has been activated. In effect this informs the user of his or her current location within the menu hierarchy.

Each second level option 400 may have an associated selection dialog. Selection dialog is intended to be a general term that encompasses a range of different interactive menu types. The selection dialogs allow the user to perform various tasks, such as entering a name, or choosing a particular value from a list. The user activates a selection dialog of this type by first highlighting its associated second level option 400 (using up button 200 and down button 202). Once the desired second level option 400 is highlighted, the user presses select button 208. Control unit 110 responds by adding the selection dialog to the active second level menu 306. Control unit 110 performs this task by overlaying the selection dialog onto the active second level menu 306. Preferably, this overlay process is performed in a way that minimizes the amount of the active second level menu 306 that is actually overlaid. The second level option 400 associated with an active selection dialog is maintained in a highlighted state. The

combination of minimal overlay and the maintained highlighting makes it easy for the user to determined which second level option 400 is active, which second level menu 306 is active, which first level option 304 is active and which first level menu 300 is active. Thus, the user can determine, at a glance, his current location in the menu hierarchy.

COMMAND CONFIRMATION SELECTION DIALOG

In Figure 5, a first type of selection dialog is shown. The selection dialog of Figure 5 is a command confirmation selection dialog. The user selects the command confirmation selection dialog using up button 200 and down button 202. When selected, control unit 110 highlights the command confirmation selection dialog. The user may then activate the command confirmation selection dialog by pressing select button 208. Control unit 110 then performs the associated command.

DROP-DOWN LIST SELECTION DIALOG

In Figure 6, a second type of selection dialog is shown. The selection dialog of Figure 6 is a drop-down list selection dialog. The drop-down list selection dialog is activated whenever the user selects the associated second level option 400. Control unit 110 positions the drop down list selection dialog to be underneath the associated second level option 400. Once the drop-down list selection dialog is activated, the user may use right button 204 and left button 206 to highlight one of the values included in the drop-down list selection dialog. When the desired value is highlighted, the user presses select button 208. Control unit 110 then closes the drop-down list selection dialog. It should be noted that, as previously discussed, the second level option 400 associated with the drop-down selection dialog list remains highlighted during the time that the drop-down list selection dialog is active.

CHARACTER TABLE SELECTION DIALOG

In Figure 7, a third type of selection dialog is shown. The selection dialog of Figure 7 is a character table selection dialog. The character table selection dialog is activated whenever the user selects the associated second level option 400. Control unit 110 positions the character table selection dialog to substantially overlay the active second level menu 306. Once the character table selection dialog is activated, the user may use right button 204, left button 206, up button 200 and down button 202 to highlight one or more characters included in the character table selection dialog. When a desired value is highlighted, the user presses select button 208. When the entire sequence of desired characters have been highlighted and selected, the user presses save button 210. Control unit 110 then closes the character table selection dialog.

NUMERIC ENTRY SELECTION DIALOG

In Figure 8, a fourth type of selection dialog is shown. The selection dialog of Figure 8 is a numeric entry selection dialog. The numeric entry selection dialog list is activated whenever the user selects the associated second level option 400. Control unit 110 positions the numeric entry selection dialog to be underneath the associated second level option 400. Once the numeric entry selection dialog is activated, the user may use the numeric buttons on remote control 112 to enter a numeric value. The user may also use delete button 218 to correct mistakes. When the desired number has been entered, the user presses save button 210. Control unit 110 then closes the numeric entry selection dialog. It should be noted that, as previously discussed, the second level option 400 associated with the numeric entry selection dialog remains highlighted during the time that the numeric entry selection dialog is active.

SLIDE BAR SELECTION DIALOG

In Figure 9, a fifth type of selection dialog is shown. The selection dialog of Figure 9 is a slide bar selection dialog. The slide bar selection dialog is activated whenever the user selects the associated second level option 400. Control unit 110 positions the slide bar selection dialog to be adjacent to the associated second level option 400. Once the slide bar selection dialog is activated, the user may use right button 204 and left button 206 to reposition the a slider 900 included in the slide bar selection dialog. When the desired value is attained the user presses select button 208. Control unit 110 then closes the slide bar selection dialog. It should be noted that, as previously discussed, the second level option 400 associated with the slide bar selection dialog remains highlighted during the time that the slide bar selection dialog is active.

In general, it should be appreciated that the previously described menu system is capable of many variations. These variations include changes in the number of hierarchical levels or the type of menu or selection dialogs included at each level. In each case, it is desirable to maintain the display of higher level menus during the activation of lower level menus as well as the highlighting of selected options within each level.

ICON CUSTOMIZATION

For some embodiments, it may be desirable to augment the menu system through the use of icon customization. Icon customization allows the user to replace first level options 304 or second level options 400 or other display elements with custom icons or labels. For example, as shown in Figure 4, second level options 400d and 400e are labeled "#l" and "#2", respectively. In the case where icon customization is supported, these generic labels can be

replaced with more descriptive icons. This descriptive icons may include digitally shrunken pictures based on screen shots gathered during prior calls to these numbers. The icons could be company logos or other graphic symbols. In each case, the fundamental idea is to allow the user to assign descriptive icons to replace more generic screen elements. Control unit 110 saves these icons between uses of video teleconferencing system 100. This allows the customized menu system to be restored and reused. The use of icon customization is particularly relevant in the phone book context just discussed. It is also relevant within menus used to store and retrieve particular orientation and zooms of camera 104.

ONE STEP EXIT

For some embodiments, it may be desirable to augment the menu system through the use of exit button 212. For this type of embodiment, control unit 110 is configured to respond to activation of exit button 212 by exiting from any currently active selection dialog, second level menu 306 and first level menu 300. This provides the user a one-step shortcut for exiting the menu hierarchy.

Other embodiments will be apparent to those skilled in the art from consideration of the specification and practice of the invention disclosed herein. It is intended that the specification and examples be considered as exemplary only, with a true scope of the invention being indicated by the following claims and equivalents.

WHAT IS CLAIMED IS:

1. A menu system for a video teleconferencing system, the menu system comprising:

one or more first level menus, each first level menu configured to be displayed when a respective button included in remote control a control device is activated; and

one or more second level menus, each second level menu configured to be displayed concurrently with the active first level menu when a respective first level option included in one of the first level menus is highlighted.

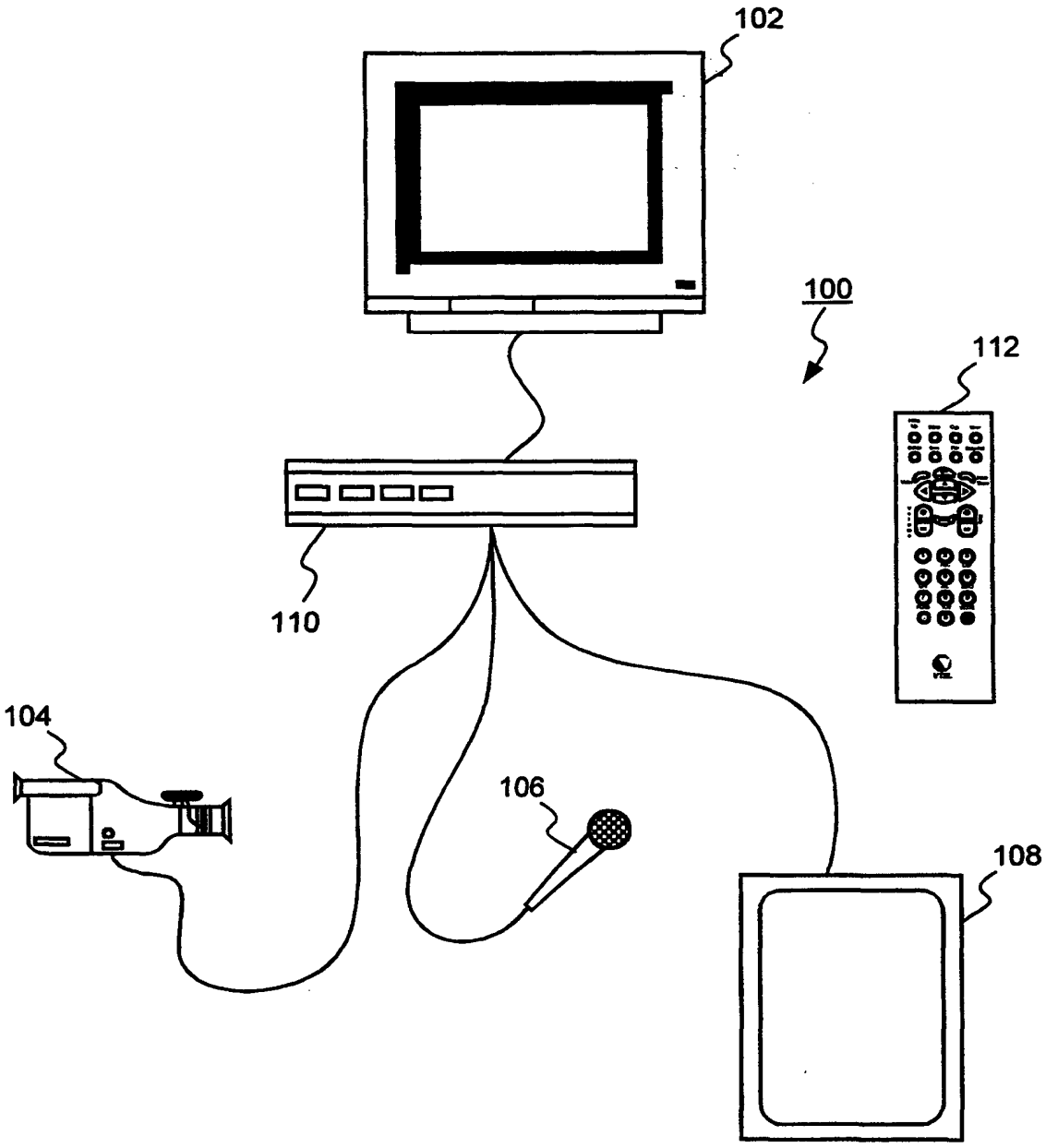

Figure 1

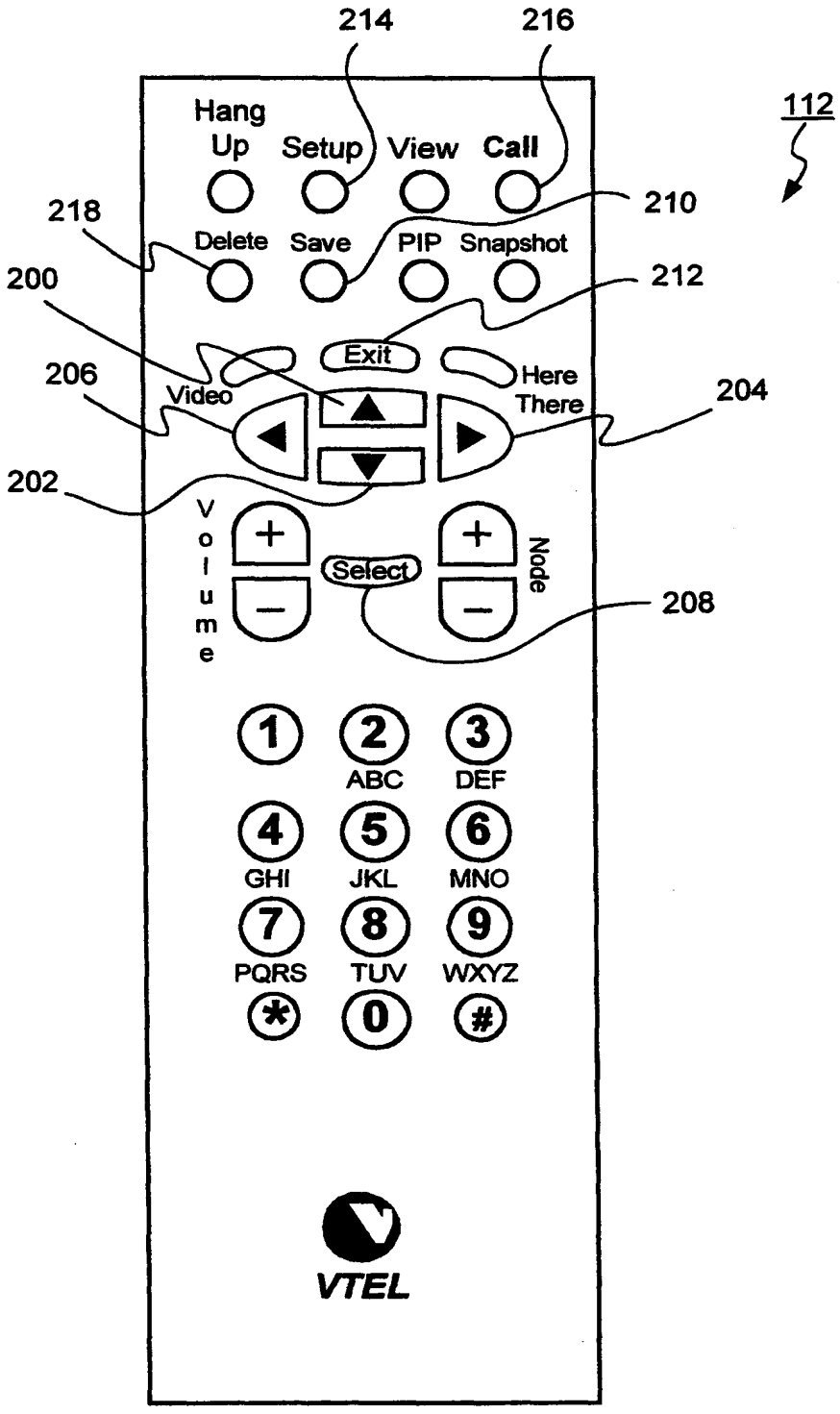

Figure 2

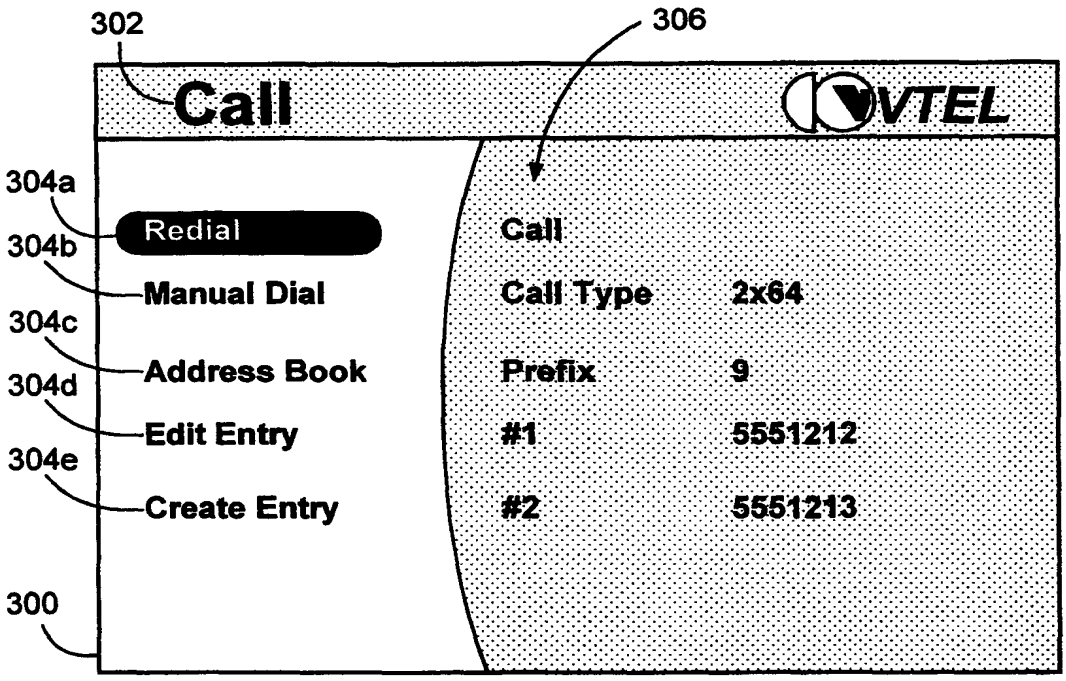

Figure 3

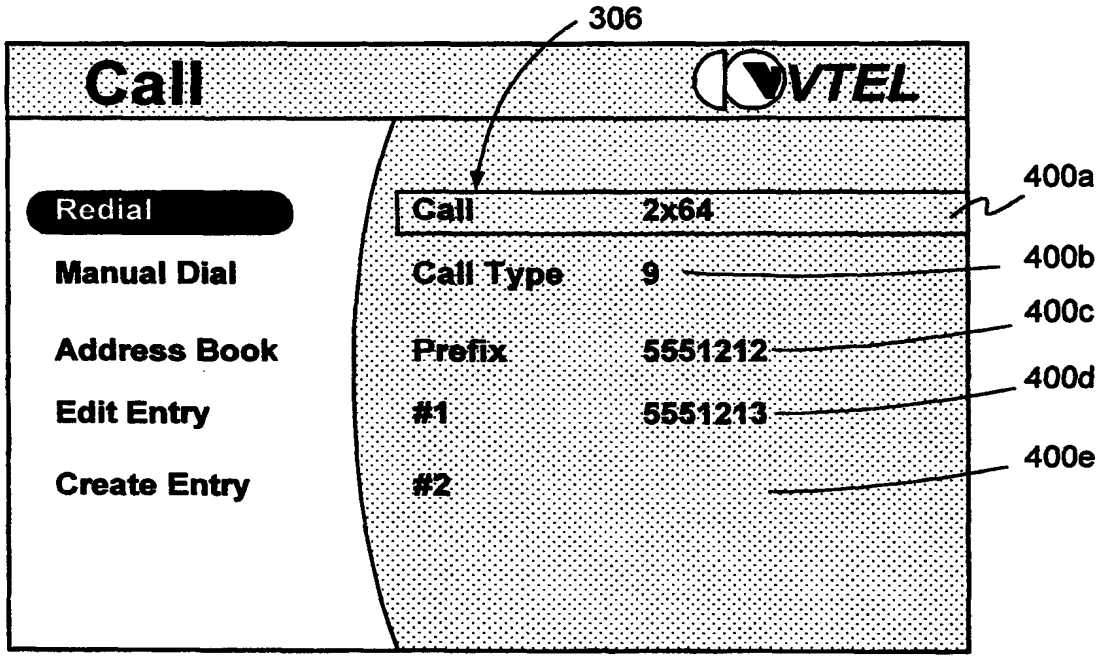

Figure 4

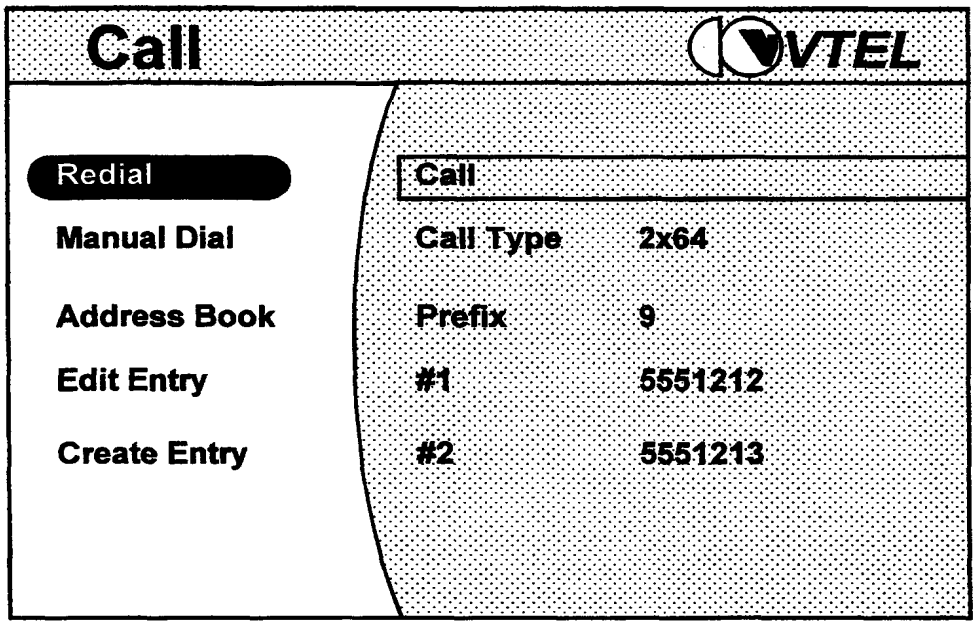

Figure 5

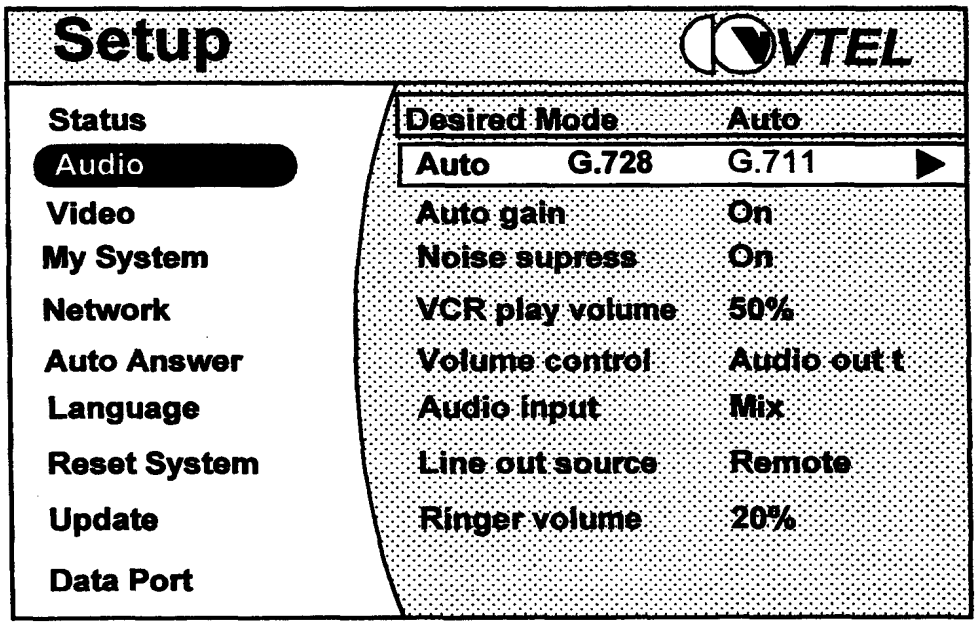

Figure 6

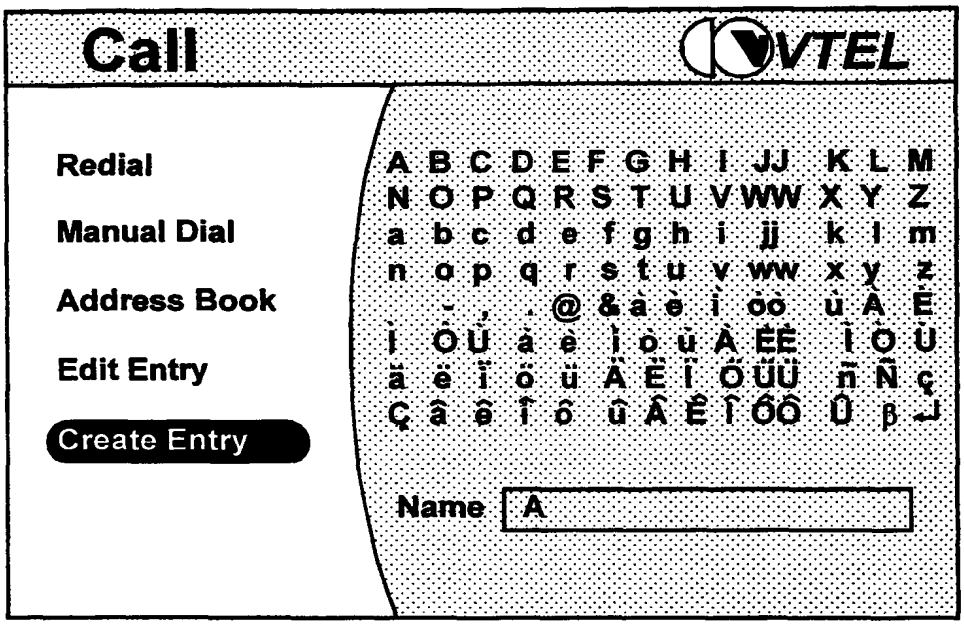

Figure 7

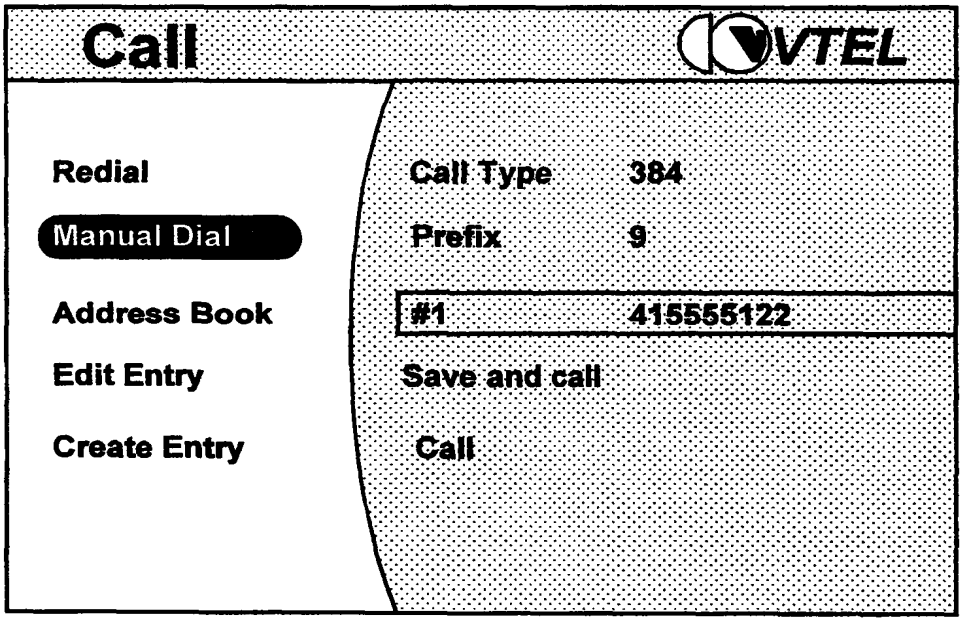

Figure 8

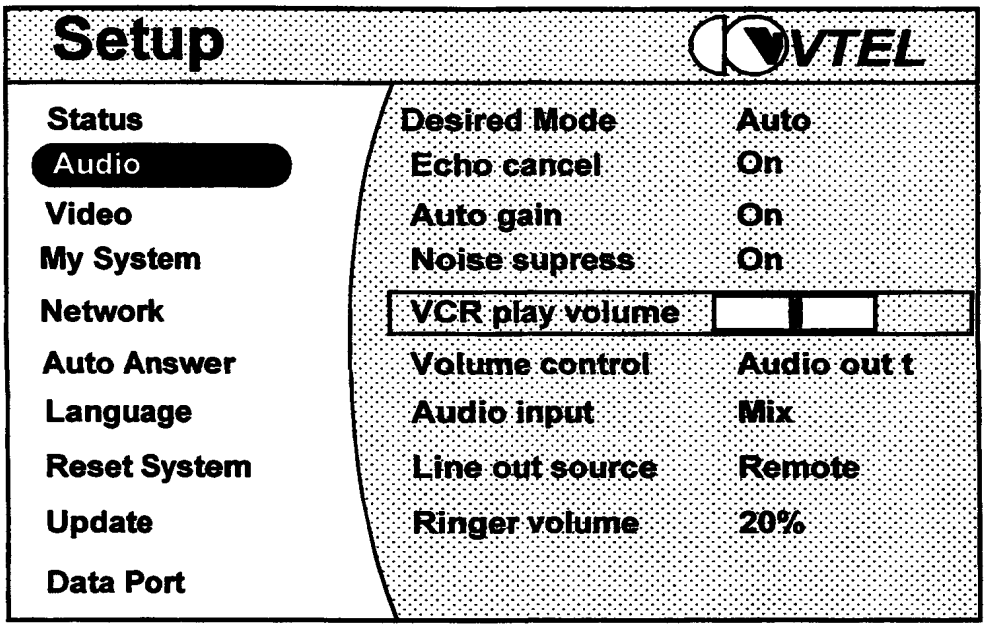

Figure 9

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US99/24964

A. CLASSIFICATION OF SUBJECT MATTER

IPC(6) :G06F 3/14
US CL : 345/352,353,356,330

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 345/352,353,356,330,336,347,348,354,169

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

WINDOWS 3.1, WINDOWS 95/NT

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

DIALOG LINK

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 5,500,794 A [FUJITA et al.] 19 March 1996, Abstract Fig.6	1
Y,P	US 5,915,010 A [MCCALMONT] 22 June 1997, Abstract, Fig.3e	1
A	US 5,689,668 A [BEAUDET et al.] 18 November 1999, Summary Fig.1	1
A,E	US 5,991,382 A [BAYLESS et al.] 23 November 1999, Abstract	1
A,P	US 5,917,491 A [BAUERSFELD] 29 June 1999, Abstract	1
A	US 5,606,374 A [BERTRAM] 25 February 1997, Abstract	1

[X] Further documents are listed in the continuation of Box C. [ ] See patent family annex.

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C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 5,594,859 A [PALMER et al.] 14 January 1997, Abstract	1
A	US 4,821,211 A [TORRES] 11 April 1989, Abstract	1

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